

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 13, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 13, 2014 07:00 to December 14, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at three locations on the fence line of the facility within the work area. Two additional units were deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . AreaRAE Unit 01 recorded one instantaneous detection of VOCs at 36.3 ppm at 11:28 on December 13, 2014; this concentration was not sustained, and no further VOC concentrations were recorded. AreaRAE Unit 03 recorded VOC detections ranging from 0.1 to 19.2 ppm and LEL readings of up to 12.6%. Field personnel responded to Unit 03 to investigate these detections with handheld instrumentation and determined these readings were the result of electronic sensor drift. AreaRAE Unit 03 was taken offline and sensors recalibrated. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, and 3 and data-logged to monitor PM_{10} . Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 13, 2014 07:00 – December 14, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	26	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O ₂	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	27	27	0.006	0.002 - 0.013 mg/m ³
	SO ₂	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	28	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	Gastec 8La	1	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	1	0	NA	<1 ppm
	LEL	MR+ / MR Pro	1	0	NA	<1 %
	O ₂	MR+ / MR Pro	1	1	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	1	1	0.005	0.005 - 0.005 mg/m ³
	SO ₂	MR+ / MR Pro	1	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	1	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	1	0	NA	<0.1 ppm
Work Area	Cl ₂	Gastec 8La	5	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	25	0	NA	<0.1 ppm
	HCl	Gastec 14L	5	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	24	0	NA	<1 %
	O ₂	MR+ / MR Pro	25	25	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	5	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	17	17	0.007	0.002 - 0.014 mg/m ³
	SO ₂	MR+ / MR Pro	12	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	5	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	24	0	NA	<0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 13, 2014 07:00 – December 14, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Unit 01	H ₂ S	5531	149	0.1 ppm	0.1 - 0.2 ppm
	LEL	5531	0	NA	< 1 %
	SO ₂	5531	87	0.1 ppm	0.1 - 0.1 ppm
	VOC	5531	4	9.6 ppm	0.4 - 36.3 ppm
Unit 02	H ₂ S	5509	10	0.1 ppm	0.1 - 0.2 ppm
	LEL	5509	0	NA	< 1 %
	SO ₂	5509	0	NA	< 0.1 ppm
	VOC	5509	22	0.1 ppm	0.1 - 0.1 ppm
Unit 03	H ₂ S	5512	49	0.1 ppm	0.1 - 0.1 ppm
	LEL	5512	13	0.05	1.5 - 12.6 %
	SO ₂	5512	0	NA	< 0.1 ppm
	VOC	5512	16	3.8 ppm	0.1 - 19.2 ppm
Unit 06	H ₂ S	1949	161	0.1 ppm	0.1 - 0.2 ppm
	LEL	1949	0	NA	< 1 %
	SO ₂	1949	0	NA	< 0.1 ppm
	VOC	1949	293	0.1 ppm	0.1 - 0.3 ppm
Unit 08	H ₂ S	1068	21	0.1 ppm	0.1 - 0.1 ppm
	LEL	1068	0	NA	< 1 %
	SO ₂	1068	52	0.1 ppm	0.1 - 0.1 ppm
	VOC	1068	0	NA	< 0.1 ppm

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²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM₁₀ Monitoring Summary¹
December 13, 2014 07:00 – December 14, 2014 07:00

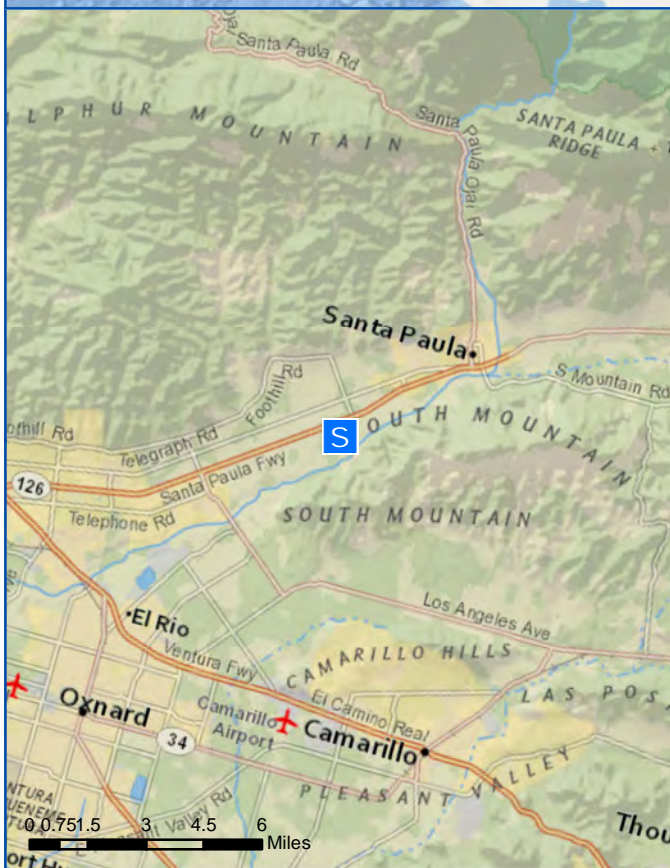
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	4741	4336	0.006	0.001 - 0.132 mg/m ³
10408087	AR02	5205	4687	0.012	0.001 - 0.271 mg/m ³
10704074	AR03	5195	4637	0.005	0.001 - 1.332 mg/m ³

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend



 Site Location



0 250 500 1,000
Feet



Legend

-  FRT Location
-  Site Location



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles







Legend

Monitoring Location

- Detect (0.002 - 0.014 mg/m³)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site

0 0.125 0.25 0.5 Miles







Legend

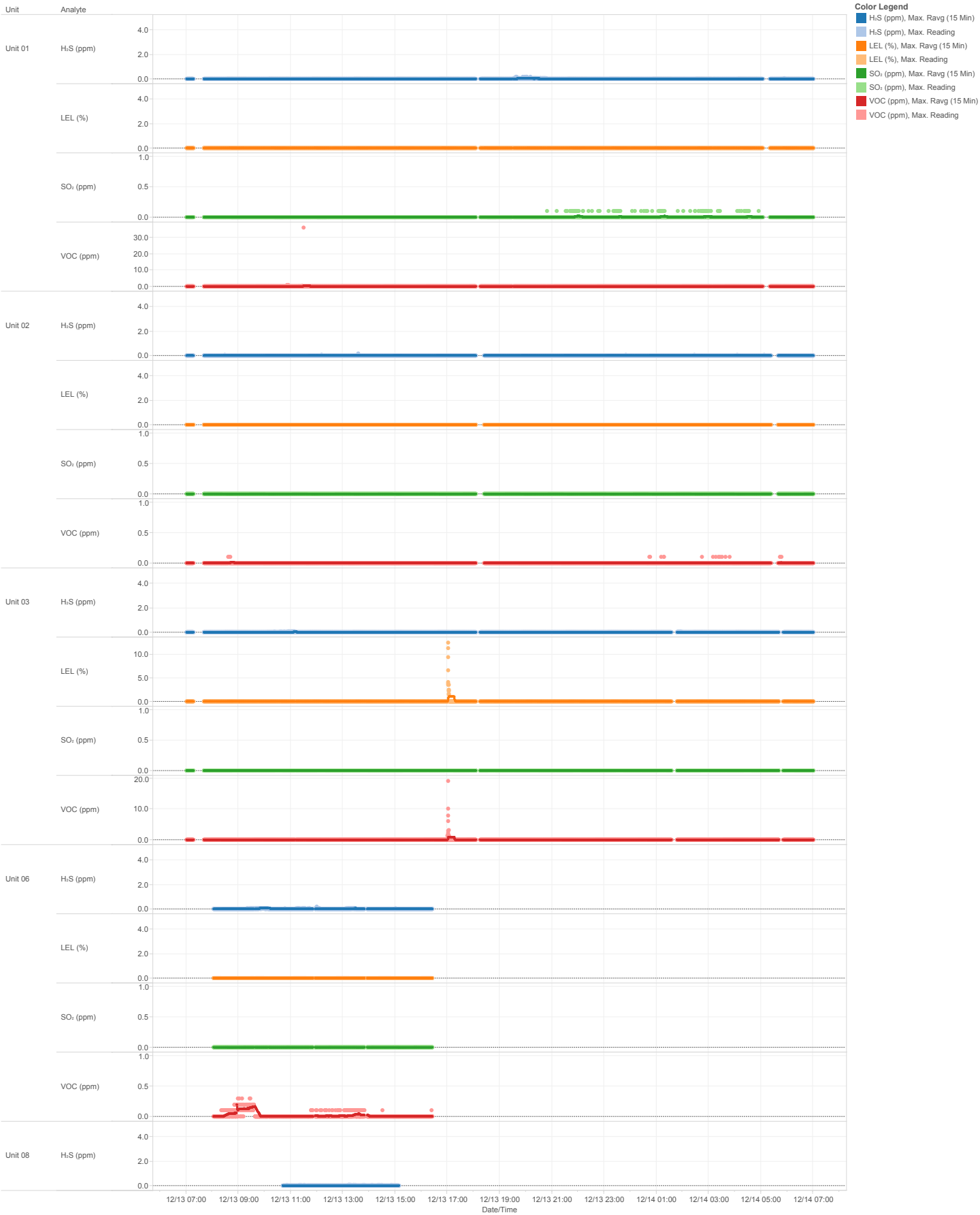
Monitoring Location

- < 0.05 ppm
- S Incident Site

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

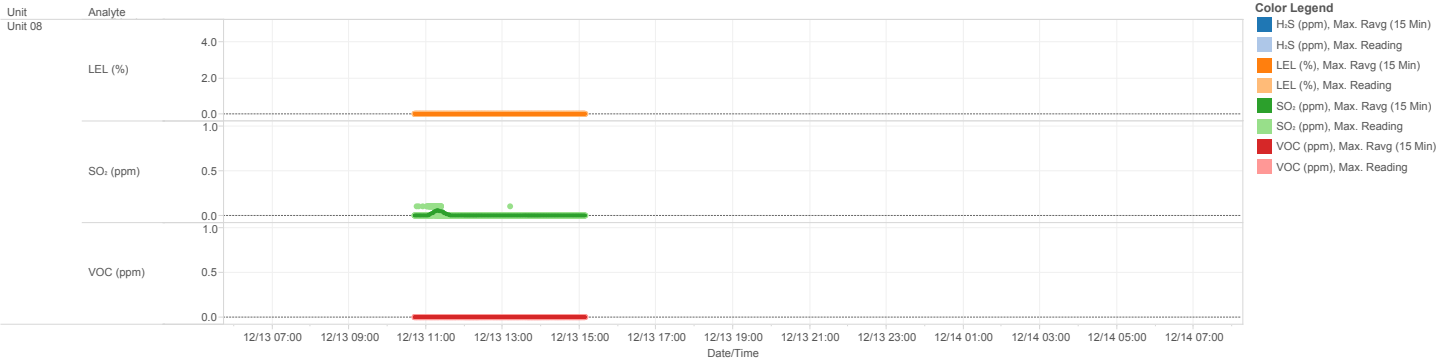
Patriot Environmental
AreaRAE Trend Graphs
12/13/2014 07:00 - 12/14/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

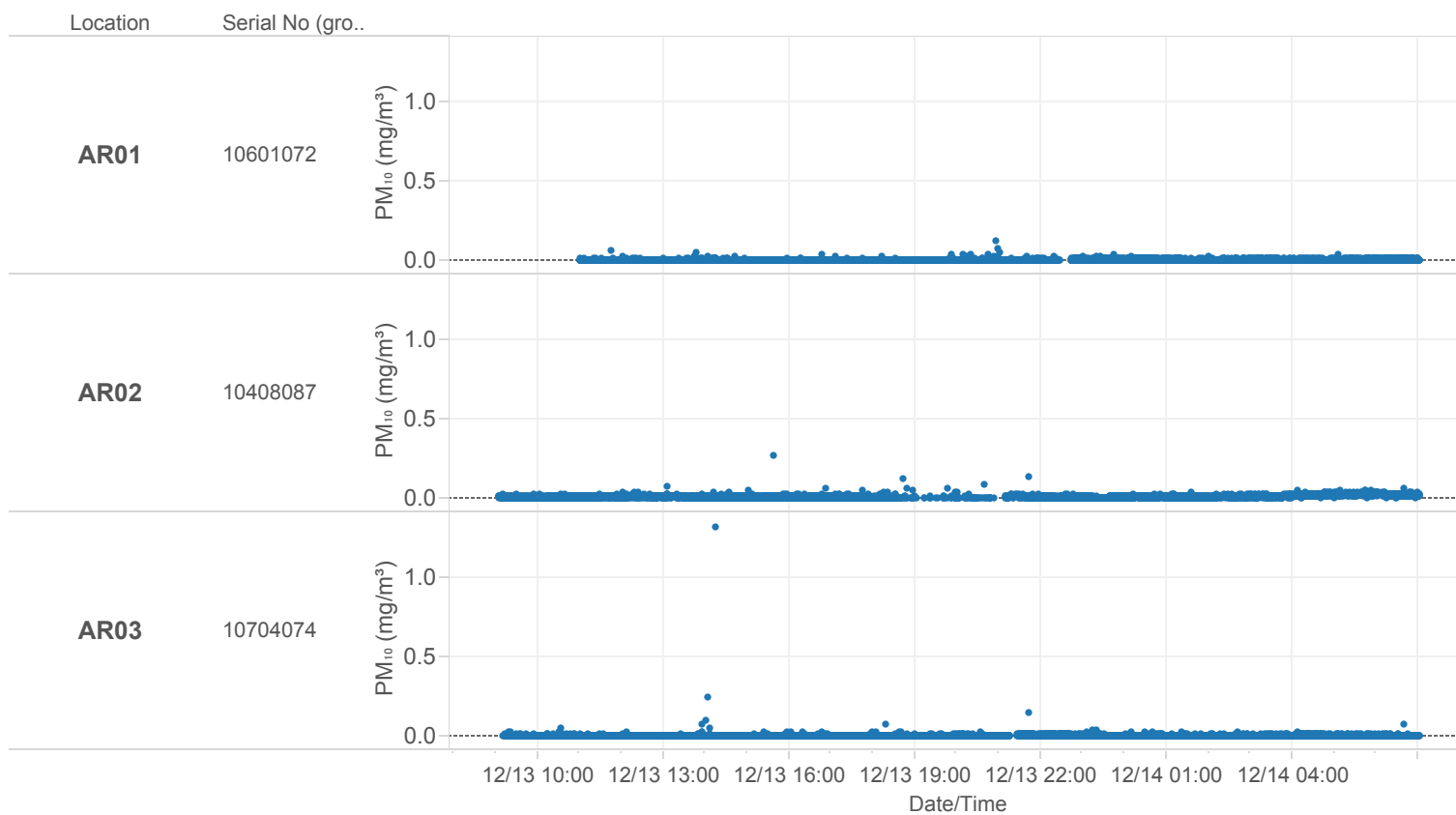
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/13/2014 07:00 - 12/14/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/13/2014 07:00 - 12/14/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format